یکتا بنی سی
مقطع: یازدهم دهم A

۱۸٫۷۵

(۱)
$y = x^2 \xrightarrow{x=1} y=1$
$\searrow x=3 \quad y=9$

$f(x) = 3^{Ax} + B \quad (1,1) \rightarrow 1 = 3^{A+B} \rightarrow A + B = 0$
$\searrow (3,9) = 9 = 3^{3A+B} \rightarrow 3A + B = 2$

۲

$A = 1$
$B = -1$

$f(x) = 3^{x-1} \xrightarrow{x=0} \boxed{\frac{1}{3}}$

(۲)
$\log_2 (4^x + 15) = x + 3 \rightarrow 2^{x+3} = 4^x + 15$
t
$\rightarrow 2^x \times 8 = (2^x)^2 + 15$
$t^2 - 8t + 15 \rightarrow (t-3)(t-5)$

۲

$t = 5 \quad t = 3$
$2^x = 5 \quad 2^x = 3$
$x_1 = \log_2 5 \quad x_2 = \log_2 3$

$x_1 + x_2 = \log_2 5 + \log_2 3 \Rightarrow \boxed{\log_2 15}$

(۳)
$(\log_{21} 3)^2 + \log_{21} (147) \log_{21} (1323) \quad \log_{21} 7 = 1 - \log_{21} 3$

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$A = (\log_{21} 3)^2 + (\log_{21} 21 + \log_{21} 7)(\log_{21} 21^2 + \log_{21} 3) \rightarrow A = (\log_{21} 3)^2 + (1 + \log_{21} 7)(2\log_{21} 21 + \log_{21} 3)$
$(\log_{21} 3)^2 + (1 + 1 - \log_{21} 3)(2 + \log_{21} 3) = (4 - (\log_{21} 3)^2) + (\log_{21} 3)^2 = 4$

(۴)
$\log (x^2 - 2x + 1) + 3\log (1-x) = 5 \rightarrow \log (1-x)^2 + 3\log (1-x) - 5 = 0 \rightarrow 5\log (1-x) = 5$

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$\log_{10}(1-x) = -1$
$0/1 = 1 - x \rightarrow \boxed{x = 0/9}$

(۵)
$\log_2 (x^2 + 2x + 4) + \log_2 (x-2) = 3 \quad (x^2 + 2x + 4)(x-2) = 8$
$x^3 - 8 = 8 \rightarrow x^3 = 16$

۲

$\log_{\frac{1}{2}} x = 3 \log_2 x = \log_2 x^3 = \log_2 16 = 4$

(6) 1,75

$$\log^{(2-x)} - \log^{\frac{1}{(x-2)^2}} = 3 \to \log^{(2-x)} - \log^{(2-x)^{-2}} = 3 \to \log^{2-x} + 2\log^{2-x} = 3$$

$$3\log^{2-x} = 3 \to x = -8$$

$$\log_{\sqrt{2}}^{8} = 6$$

$$\log_{\sqrt{2}}^{8} = \log_{2^{\frac{1}{2}}}^{2^3} = 6$$

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(7)

$$if: \ 3^{x^2-2} = 81^x \to 3^{x^2-2} = 3^{4x} \to x^2 - 4x = 2$$

$$(x-2)^2 - 4 = 2 \to (x-2)^2 = 6 \to x-2 = \pm\sqrt{6} \begin{cases} x = 2-\sqrt{6} < 2 \ \times \\ x = 2+\sqrt{6} \end{cases}$$

2

$$\log_6^{x-2} \xrightarrow{x=\sqrt{6}+2} \log_6^{2+\sqrt{6}-2} = \frac{1}{2}$$

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(8)

$$\log_3^2 = \frac{5}{8} \qquad \log_{18}^{8} = ? \to \frac{\log_3^8}{\log_3^{18}} \to \frac{3\log_3^2}{2\log_3^3 + \log_3^2} \to \frac{\frac{15}{8}}{\frac{16+5}{8}} \to \frac{15}{21} = \frac{5}{7}$$

2

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(9)

$$\log_4^3 = 0.8 \to \frac{1}{2}\log_2^3 = 0.8 \to \log_2^3 = 1.6$$

2

$$\log_{12}^{6} \to \frac{\log_2^6}{\log_2^{12}} = \frac{\log_2^2 + \log_2^3}{2\log_2^2 + \log_2^3} \to \frac{1+1.6}{2+1.6} \to \frac{2.6}{3.6} \to \frac{1.3}{1.8}$$

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(10)

$$(a\log 2)x^2 + ax + b\log 2 = 0$$

2

$$\log 2\,(a+b) = a \qquad \frac{a+b}{a} \times \log 2 = 1 \to \left(1+\frac{b}{a}\right)\log 2 = 1$$

$$\log 2^{\left(1+\frac{b}{a}\right)} = 1 \to 10 = 2 \times 2^{\frac{b}{a}} \to 2^{\frac{b}{a}} = 5 \to (\sqrt{2})^{\frac{b}{a}} =$$

$$2^{\left(\frac{1}{2}\right)\left(\frac{b}{a}\right)} = \left(2^{\frac{b}{a}}\right)^{\frac{1}{2}} \to 5^{\frac{1}{2}} = \sqrt{5}$$

۴) $\log (x-۱)^{۲} + \log (۱-x)^{۳} = ۵ \rightarrow \log_{۱۰} -(x-۱)^{۵} = ۵$

$\rightarrow (۱-x)^{۵} = ۱۰^{۵} \rightarrow ۱-x = ۱۰ \rightarrow x = -۹$ $\qquad \log_{۳}^{-x} = ۲$